

1 Evolving virtual creatures

Karl Sims

July 1994 Proceedings of the 21st annual conference on Computer graphics and interactive techniques SIGGRAPH '94

Publisher: ACM Press

Full text available: pdf(84.65 KB) Additional Information: full citation, abstract, references, citings, index terms

This paper describes a novel system for creating virtual creatures that move and behave in simulated three-dimensional physical worlds. The morphologies of creatures and the neural systems for controlling their muscle forces are both generated automatically using genetic algorithms. Different fitness evaluation functions are used to direct simulated evolutions towards specific behaviors such as swimming, walking, jumping, and following. A genetic language is presented that uses no ...

2 CYBER-SURFING: the state-of-the-art in client server browsing and navigation

Hal Berghel

February 1995 Proceedings of the 1995 ACM symposium on Applied computing SAC '95

Publisher: ACM Press

Full text available: pdf(460.71 KB) Additional Information: full citation, references, citings, index terms

3 Visualisation: Evolving controllers for virtual creature locomotion

Michael Sanders, Richard Lobb, Patricia Riddle

February 2003 Proceedings of the 1st international conference on Computer graphics and interactive techniques in Australasia and South East Asia

GRAPHITE '03

Publisher: ACM Press

Full text available: pdf(383.80 KB) Additional Information: full citation, abstract, references

We consider the application of Evolutionary Algorithms (EAs) to the problem of automating the locomotion of computer-simulated creatures. We introduce *niching* as a way of maintaining genetic diversity and show that it results in the generation of a range of locomotion controllers and increases the probability of finding difficult or rare locomotion modes.

Keywords: evolutionary algorithms, locomotion controllers, mass-spring systems,

niching, virtual creatures

4	Multi-level direction of autonomous creatures for real-time virtual environments  Bruce M. Blumberg, Tinsley A. Galyean September 1995 Proceedings of the 22nd annual conference on Computer graphics and interactive techniques SIGGRAPH '95  Publisher: ACM Press Full text available: pdf(87.35 KB) ps(560.71 KB)  Additional Information: full citation, references, citings, index terms	
5	Michael Hess March 1985 Proceedings of the second conference on European chapter of the	
6	Interaction and design I: A swarm algorithm for wayfinding in dynamic virtual worlds  Ji Soo Yoon, Mary Lou Maher  November 2005 Proceedings of the ACM symposium on Virtual reality software and technology VRST '05  Publisher: ACM Press  Full text available: Additional Information: full citation, abstract, references, index terms, review  Wayfinding is a cognitive element of navigation that allows people to plan and form strategies prior to executing them. Wayfinding in large scale virtual environments is a complex task and even more so in dynamic virtual worlds. In these dynamic worlds everything, including the objects, the paths, and the landmarks, may be created, deleted, and moved at will. We propose a wayfinding tool using swarm creatures to aid users in such dynamic environments. The tool produces dynamic trails leading to  Keywords: navigation, navigation/wayfinding aids, swarm intelligence, virtual worlds, wayfinding	
7 �	The virtual oceanarium  Torsten Fröhlich July 2000 Communications of the ACM, Volume 43 Issue 7  Publisher: ACM Press  Full text available: pdf(2.17 MB) Additional Information: full citation, references, citings, index terms	

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8	VR based entartainment & education: The ANIMUS project: a framework for the	
	creation of interactive creatures in immersed environments  Daniel Torres, Pierre Boulanger	
	October 2003 Proceedings of the ACM symposium on Virtual reality software and	
	technology VRST '03 Publisher: ACM Press	
	Full text available: pdf(366.43 KB) Additional Information: full citation, abstract, references, citings	
	This paper describes the architecture of the ANIMUS framework. This framework facilitates the creation of synthetic characters that convey the illusion of being <i>alive</i> . The components of ANIMUS are inspired by observations made in biological organisms, and provide means for creating autonomous agents that mimic awareness of their environment, of other agents, and of human audience. They also show particular roles, personality, and emotions, active and reactive behavior, automatic reflexes,	
	<b>Keywords</b> : VR entertainment, agent architectures, artificial intelligence, artificial perception, believable agents, broad agents, human-machine interaction, inmersive environments, intelligent agents, interactive art, synthetic creatures	
9	Autonomous characters & flocking: Generating flying creatures using body-brain coevolution	
	Yoon-Sik Shim, Chang-Hun Kim July 2003 Proceedings of the 2003 ACM SIGGRAPH/Eurographics symposium on Computer animation SCA '03	
	Publisher: Eurographics Association  Full text available: pdf(2.19 MB) Additional Information: full citation, abstract, references, citings	
	This paper describes a system that produces double-winged flying creatures using bodybrain co-evolution without need of complex flapping flight aerodynamics. While artificial life techniques have been used to create a variety of virtual creatures, little work has explored flapping-winged creatures for the difficulty of genetic encoding problem of wings with limited geometric primitives as well as flapping-wing aerodynamics. Despite of the simplicity of system, our result shows aesthetical looki	
10	Mobile: Open experiments of mobile sightseeing support systems with shared virtual	
•	worlds Hiroyuki Tarumi, Kayo Yokoo, Shoji Nishimoto, Kazuya Matsubara, Yasushi Harada, Fusako Kusunoki, Sangtae Kim, Yuki Mizukubo	
	June 2006 Proceedings of the 2006 ACM SIGCHI international conference on Advances in computer entertainment technology ACE '06	
	Publisher: ACM Press Full text available: pdf(668.75 KB) Additional Information: full citation, abstract, references, index terms	
	· .	
	In this paper, we describe results from the experiments of a location-dependent shared virtual world system applied to sightseeing entertainment. This system can be used with GPS-phones on the current Japanese market. Users can enjoy interacting with virtual objects including virtual animals/agents. Subjects of the experiments were real tourists who had their own GPS-phones compatible with our system. We found that evaluations on the system varied depending on age, gender, and experiences of sub	
	Keywords: mobile phones, shared virtual environment, user study	
11	Communication through virtual active objects overlaid onto the real world Hiroyuki Tarumi, Ken Morishita, Yusuke Ito, Yahiko Kambayashi September 2000 <b>Proceedings of the third international conference on Collaborative</b>	

٩	virtual environments CVE '00 Publisher: ACM Press	
·	Full text available: pdf(1.46 MB)  Additional Information: full citation, references, citings, index terms	
	<b>Keywords</b> : CVE architecture, augmented reality, autonomous agents, community computing, mobile systems, overlaid virtual systems, virtual pets	
12	Session 2C: life-like and believable qualities: Using an ethologically-inspired model to learn apparent temporal causality for planning in synthetic creatures  Robert Burke, Bruce Blumberg  July 2002 Proceedings of the first international joint conference on Autonomous agents and multiagent systems: part 1 AAMAS '02	
	Publisher: ACM Press Full text available: pdf(284.73 KB) Additional Information: full citation, abstract, references, index terms	
	Inspired by recent work in ethology and animal training, we integrate representations for time and rate into a behavior-based architecture for autonomous virtual creatures. The resulting computational model of affect and action selection allows creatures to discover and refine their understanding of apparent temporal causality relationships which may or may not involve self-action. The fundamental action selection choice that a creature must make in order to satisfy its internal needs is whether	
	<b>Keywords</b> : apparent temporal causality, autonomous agents, ethology, planning, reactive systems, synthetic characters, virtual creatures	
13	Daniel Thalmann, Christophe Hery, Seth Lippman, Hiromi Ono, Stephen Regelous, Douglas Sutton August 2004 ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04 Publisher: ACM Press	
	Full text available: pdf(20.19 MB) Additional Information: full citation, abstract  A continuous challenge for special effects in movies is the production of realistic virtual crowds, in terms of rendering and behavior. This course will present state-of-the-art techniques and methods. The course will explain in details the different approaches to create virtual crowds: particle systems with flocking techniques using attraction and repulsion forces, copy and pasting techniques, agent-based methods. The architecture of software tools will be presented including the MASSIVE softwa	
14	Bill Tomlinson, Bruce Blumberg, Delphine Nain June 2000 Proceedings of the fourth international conference on Autonomous agents AGENTS '00	
	Publisher: ACM Press Full text available: pdf(1.02 MB) Additional Information: full citation, references, citings, index terms	
	Keywords: autonomous cinematography, behavior-based agents	
15	Information exploration using The Pond Olov Ståhl, Anders Wallberg, Jonas Söderberg, Jan Humble, Lennart E. Fahlén, Adrian	



Bullock, Jenny Lundberg

September 2002 Proceedings of the 4th international conference on Collaborative virtual environments CVE '02

Publisher: ACM Press

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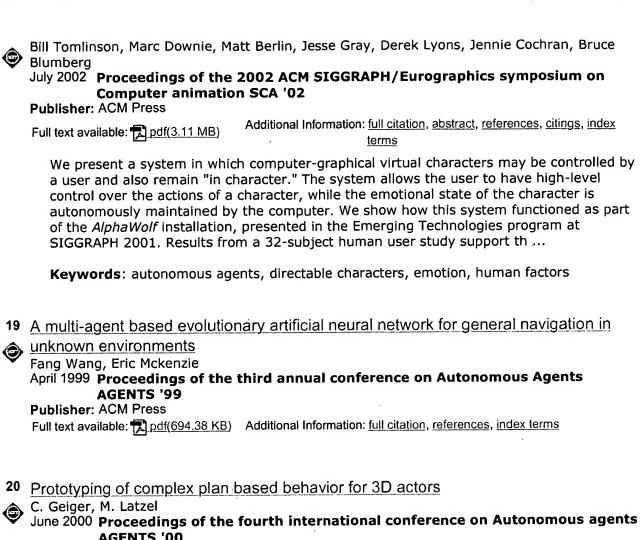
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In this paper we describe The Pond, a system used to search for and visualise data elements on an engaging tabletop display. The Pond uses methods of unencumbered interaction and audio feedback to allow users to investigate data elements, and supports shoulder-to-shoulder collaboration with the physical Pond artefact mediating the collaboration between those people gathered around it. The user interface is based on an ecosystem metaphor, presenting data elements in the form of shoals of aquatic ...

**Keywords**: database, searching, virtual environment, visualization

16	Art session 1: augmented and virtual spaces for creative learning, collaboration, and	
<b></b>	Alama Alama and Alama Al	
	Full text available: pdf(3.36 MB)  Additional Information: full citation, abstract, references, citings, index terms	
	We introduce a novel approach to the creation of Virtual Reality Art installations, which supports the design of alternative worlds, in which laws of Physics can be redefined to induce new user experiences. To implement this concept of "Alternative Reality", we have used Artificial Intelligence techniques to support the definition of the virtual environment behaviour, an approach inspired by Qualitative Reasoning systems. Besides the redefinition of physical laws, we have developed mechanisms	
	Keywords: causality, digital arts, intelligent virtual environments, qualitative physics	
17	A heterogeneous animated platform for educational participatory simulations Bill Tomlinson	
	May 2005 Proceedings of th 2005 conference on Computer support for collaborative learning: learning 2005: the next 10 years! CSCL '05  Publisher: International Society of the Learning Sciences  Full text available: pdf(157.48 KB) Additional Information: full citation, abstract, references	
	This paper describes a multi-user interactive installation featuring real time animated creatures and a mobile interaction paradigm. This paradigm has been designed to serve as a platform for education in a variety of content domains. Drawing on previous research in mobile computing and animated educational systems, this project contributes a novel metaphor for interactions among real and virtual creatures and worlds. This "Land/Water" metaphor offers that virtual space is like land for virtual	
	<b>Keywords</b> : handheld/mobile devices, human-computer interaction, participatory simulations, virtual/3D environments	

Wolves and cubism: Leashing the AlphaWolves: mixing user direction with autonomous emotion in a pack of semi-autonomous virtual characters



**AGENTS '00** 

Publisher: ACM Press

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Keywords: 3D actors, animation, complex plans, multi-agent system

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